

## Fact Sheet/Statement of Basis

### OVERVIEW OF FORT JACKSON

Fort Jackson is located in Richland County in central South Carolina. The installation is situated on the eastern edge of the city of Columbia, and covers an area of approximately 52,301 acres of contiguous property. The population for Columbia, including FTJA is estimated at 286,000. The primary mission at Fort Jackson is to provide initial entry training for the U.S. Army.

In July 1998, the facility obtained an operating permit for their hazardous waste container storage facility in accordance with R.61-79.264.

The sites requiring corrective action activities under the draft permit are identified as Solid Waste Management Units and Areas of Concern. This permit also contains conditions for the identification of Solid Waste Management Units at the facility and the implementation of corrective action for those units, if necessary.

The Fact Sheet/Statement of Basis (FS/SOB) is being prepared in accordance with the requirements of R61-79.124.8 of the South Carolina Hazardous Waste Management Regulations (SCHWMR). The FS/SOB explains the proposed remedies for the following Solid Waste Management Units (SWMUs) at Fort Jackson (FTJA).

### SUMMARY OF CHANGES

Since the last permit corrective measures have been selected for eleven (11) Solid Waste Management Units (SWMUs), one (1) Area of Concern (AOC). An addition of one (1) Area of Concern (AOC) has also been added.

#### Remedy Selected

Land Use Controls (LUCs)	No Further Action (NFA)
SWMU 1 ó Active Sanitary Landfill	SWMU 39 ó Marine WETSITE Wash Pad
SWMU 2 ó Inactive Sanitary Landfill - 1	SWMU 47 ó Former Roads and Grounds Storage Area
SWMU 3 ó Inactive Sanitary Landfill ó 2	SWMU 52 ó Former Tanks Repair Shop
SWMU 6 ó Tank Hill Landfill	AOC B ó Tank 1619
SWMU 14 ó Weapons Cleaning Area	
SWMU 21 ó Construction Debris Landfill ó Range 17	
SWMU 48 ó Inactive Bldg 6586 Acid Pit	
SWMU 50 ó Former National Guard C&D Landfill	

#### Additional AOC Added

AOC R ó Bldg 2607 Carwash O/W Sep
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## **SWMU 1**

This FS/ SOB is intended to inform the general public of the Selected Remedy, consisting of a dermal cover and land use controls (LUCs) with monitoring, for SWMU 1 at Fort Jackson. The Selected Remedy was acknowledged in the September 29, 2008, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter. This statement is at the end of the fact sheet.

The FS/SOB should not be considered the primary source of information for this site. The FS/SOB summarizes information that can be found in greater detail in the following documents:

- RCRA Facility Investigation Report for Solid Waste Management Units 1, 2, and 3. (Ecology and Environment, 1999);
- Phase II RCRA Facility Investigation Work Plan for SWMUs 1, 2, and 3 (CH2M Hill, 2002)
- Phase II RFI Report for SWMU 1, (ARCADIS, May 22, 2005)
- SWMUs 1 and 2 Interim Measure Work Plan (ARCADIS, March 24, 2005)
- SWMUs 1 and 2 Interim Measure Completion Report, Revision 1 (ARCADIS, September 13, 2006)
- SWMU 1 Corrective Measures Study Report, Revision 1 (ARCADIS, September 25, 2008)

## **PROPOSED REMEDY**

Historical media sampling events included soil (surface and subsurface), groundwater, surface water, sediment, and soil gas. Evaluations of laboratory data as well as human health and ecological risk assessments of identified contaminants revealed no unacceptable risks associated with any constituents or media at SWMU 1. Due to the low-risk nature of environmental impacts, as indicated by historical sampling and assessment results, Tier I Partnering Team members concurred that SWMU 1 did not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy was identified as maintenance of the existing dermal cover, coupled with Land Use Controls (LUC) and monitoring. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

Solid Waste Management Unit 1 (SWMU 1), also known Active Sanitary Landfill #3 was actively utilized for disposal of solid wastes at Fort Jackson between the years of 1974 and 1994. The site is currently inactive and is located within the cantonment area at the east end of Ivy Road, north of Semmes Road, and east of Chestnut Road.

Based on evaluations of historical site-related documentation, and the information gained during cover assessment and interim measure activities, SWMU 1 has been delineated to cover an area of approximately 70 acres. The 70 acres has been sub-divided into 2 areas: a 50-acre parcel utilized between the years of 1974 and 1988; and a 20-acre parcel utilized between the years of 1988 and

1994. The 20-acre parcel has undergone final closure in accordance with South Carolina Solid Waste Regulations (Subtitle D). The 50-acre parcel underwent final closure activities prior to the current Subtitle D regulations. The Selected Remedy described herein applies this 50-acre parcel. Phase I and Phase II RCRA Facility Investigations were completed in 1998 and 2007 respectively. Investigations concluded that, although Constituents of Potential Concern (COPC) were identified in specific media at the site, no unacceptable risks were associated with these COPCs. In 2004, a landfill cover assessment was completed at SWMU 1. Results of the cover assessment identified several locations within the SWMU boundary with less than 2-feet of soil cover over buried debris. Surficial debris was also identified sporadically over the site. In 2005, Interim Measure (IM) Construction activities were performed at SWMU 1. The IM included the consolidation and removal of surficial debris, site wide drainage improvements, and placement of supplemental soil cover material in order to achieve a 2-foot clean soil cover. Disturbed areas of the site were subsequently vegetated in order to restore the site to a stable condition. Completion of the IM resulted in compliance with the physical requirements of the Selected Remedy.

## **SITE RISK**

Historical confirmatory sampling events evaluated soil, groundwater, surface water, and sediment. Based on the results of these sampling events, Human Health and Ecological Risk Assessments were completed evaluating all Constituents of Potential Concern (COPC) that were identified in these media. The risk assessments concluded that there were no unacceptable risks associated with COPCs identified at SWMU 1 as a result of the former landfill.

## **SCOPE OF CORRECTIVE ACTION**

Results of site-specific confirmatory sampling events and risk assessments indicate that there is no unacceptable risks associated with previously identified compounds in soil, groundwater, sediment, or surface water. Because there are no unacceptable risks, no media cleanup objectives are required to achieve media-specific regulatory standards. Media cleanup objectives at SWMU 1 will focus primarily on maintaining the integrity of the existing dermal cover system to prevent human and wildlife contact with residual debris and subsequently ensuring that selected future land use scenarios are maintained. Media cleanup objectives will be supported by groundwater monitoring events for a limited period of time to confirm that the current groundwater quality is maintained. After an initial monitoring period, pending evaluation of the analytical results, Fort Jackson will petition for either a change in frequency, change in the number of monitoring points, or termination of the groundwater monitoring activities altogether. Should the evaluation show monitoring results exceeding maximum contaminant levels (MCLs) or indicate that they may potentially exceed MCLs in the future, the monitoring program will be extended.

## **SWMU 2**

This FS/SOB is intended to inform the general public of the Selected Remedy, consisting of a dermal cover and land use controls (LUCs) along with monitoring, for SWMU 2 at Fort Jackson. The Selected Remedy was acknowledged in the April 3, 2008, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (Christi Pickett to Lahiri Estaba). SCDHEC will make a final determination of the Selected Remedy after the public comment period has ended and all information submitted has been reviewed and considered.

The FS/SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Phase I RCRA Facility Investigation Report for Solid Waste Management Units 1, 2, and 3, Fort Jackson, South Carolina (E&E, 1999);
- Technical Memorandum: Summary of June 2000 Fieldwork at SWMU 2, Fort Jackson, South Carolina (CH2M Hill, September 2000);
- Technical Memorandum: Summary Results of the November 2000 Fieldwork at SWMU 2, Fort Jackson, South Carolina (CH2M Hill, December 2000);
- SWMUs 1 and 2 Interim Measures Completion Report, U.S. Army Training Center and Fort Jackson, South Carolina, Revision 1 (ARCADIS, September 2003);
- Revised Phase II RCRA Facility Investigation Report for SWMU 2, Fort Jackson, South Carolina (ARCADIS, April 2007).
- FTJA-2 / SWMU 2 Corrective Measures Study Report (ARCADIS, March 2008)

## **PROPOSED REMEDIES**

Historical media sampling events included soil (surface and subsurface), groundwater, surface water, sediment, and soil gas. Evaluations of laboratory data as well as human health and ecological risk assessments of identified contaminants revealed no unacceptable risks associated with any of the constituents or media at SWMU 2. Due to the low-risk nature of environmental impacts, as indicated by historical sampling and assessment results performed at SWMU 2, Tier I Partnering Team members concurred that this site did not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy was identified as maintenance of the existing dermal cover coupled with Land Use Controls (LUC) and monitoring. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

Solid Waste Management Unit 2 (SWMU 2), also known as Former Sanitary Landfill #1, was actively utilized for disposal of solid wastes at Fort Jackson between the years of 1941 and 1951. The site is currently inactive and is located on the south side of Lee Road within the Cantonment area. At the present time, the U.S. Army Reserve Center is located just north of the SWMU and the Palmetto Lodge is located just south of the SWMU.

Based on evaluations of historical site-related documentation and the information gained during landfill cover assessment and interim measure activities, SWMU 2 has been delineated to cover an

area of approximately 6.93 acres. This area includes both the former trench and fill landfill areas as well as areas identified as containing a landfill debris / soil mixture utilized for construction of erosion control terracing after landfill closure.

RCRA Facility Investigations (Phase I and II) were initiated in 1997 and completed in 2007. Investigations concluded that, although Constituents of Potential Concern (COPC) were identified in specific media at the site, no unacceptable risks were associated with these COPCs. In 2004, a landfill cover assessment was completed at SWMU 2. Results of the cover assessment concluded that 2 locations were present within the SWMU boundary with less than 2 feet of soil cover over former landfill areas. There were also several areas of erosion identified within the SWMU boundary. Surficial debris, not associated with the past landfilling activities, was also identified both inside and outside of the SMWU boundary.

In 2005, Interim Measure (IM) Construction activities were completed at SWMU 2. The IM included the removal of approximately 10 tons of surficial debris (trash), placement of supplemental dermal cover at locations where the landfill cover was determined to be less than 2 feet thick, and the construction of drainage improvements including berms, rip-rap lined ditches and swales, and surficial drainage pipes. Completion of the IM resulted in compliance with the physical requirements of the Selected Remedy.

## **SITE RISK**

Historical media sampling events evaluated soil, groundwater, surface water, sediment, and soil gas. Based on the results of these sampling events, Human Health and Ecological Risk Assessments were completed evaluating all Constituents of Potential Concern (COPC) that were identified in these media. The risk assessments concluded that there was no unacceptable risks associated with COPCs identified at SWMU 2 as a result of past landfill activities.

## **SCOPE OF CORRECTIVE ACTION**

Results of site-specific confirmatory sampling events and risk assessments indicate that there is no unacceptable risks associated with previously identified compounds in soil, groundwater, sediment, or surface water. Because there are no unacceptable risks, media cleanup objectives are not required to achieve media-specific regulatory standards. Media cleanup objectives at SWMU 2 will focus primarily on maintaining the integrity of the existing soil cover system to prevent human and wildlife contact with residual landfill material and subsequently ensuring that selected future land use scenarios are maintained. Media cleanup objectives will be supported by semi-annual groundwater monitoring events for a period of three years, followed by annual groundwater monitoring for two years in order to confirm that the current groundwater quality is maintained. After this initial monitoring period, pending evaluation of the analytical results, Fort Jackson will petition for either a change in frequency or termination of the groundwater monitoring activities. Should the evaluation show monitoring results exceeding maximum contaminant levels (MCLs) or indicate that they may potentially exceed MCLs in the future, the monitoring program will be extended.

### **SWMU 3**

This FS/SOB is intended to inform the general public of the Selected Remedy, consisting of a dermal cover and land use controls (LUCs) along with monitoring, for SWMU 3 at Fort Jackson. The Selected Remedy was acknowledged in the September 29, 2008, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (Christi Pickett to Lahiri Estaba). SCDHEC will make a final determination of the Selected Remedy after the public comment period has ended and all information submitted has been reviewed and considered.

The SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Phase I RCRA Facility Investigation Report for Solid Waste Management Units 1, 2, and 3, Fort Jackson, South Carolina (E&E, 1999);
- SWMU 3 Phase II RCRA Facility Investigation Report, (ARCADIS, February 7, 2005)
- SWMU 3 Interim Measures Completion Report, U.S. Army Training Center and Fort Jackson, South Carolina (ARCADIS, October 4, 2007);
- SWMU 3 Corrective Measures Study Report, Revision 1 (ARCADIS, September 25, 2008)

### **PROPOSED REMEDIES**

Historical media sampling events included soil (surface and subsurface), groundwater, surface water, sediment, and soil gas. Evaluations of laboratory data as well as human health and ecological risk assessments of identified contaminants revealed no unacceptable risks associated with any of the constituents or media at SWMU 3. Due to the low-risk nature of environmental impacts, as indicated by historical sampling and assessment results performed at SWMU 3, Tier I Partnering Team members concurred that this site did not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy was identified as maintenance of the existing dermal cover coupled with Land Use Controls (LUC) and monitoring. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

### **SITE BACKGROUND**

Solid Waste Management Unit 3 (SWMU 3), also known as Former Sanitary Landfill #2, was actively utilized as a trench and fill sanitary landfill at Fort Jackson between the years of 1951 and 1974. The site is currently inactive and is located southeast of the cantonment area between Washington and Ewell Roads. At the present time, the Defense Reuse and Marketing Office (DRMO) is currently operating on the southwest end of the SWMU. SWMU 3 consists of 3 primary components, a former trench and fill style landfill, former burning pits (located partially beneath the DRMO facility), and an area of surface and subsurface disposal of construction and demolition debris (C&D) material.

Based on evaluations of historical site-related documentation and the information gained during landfill cover assessment and interim measure activities, SWMU 3 has been delineated to cover an area of approximately 100 acres. This area includes both former trench and fill landfill areas

as well as areas identified during Interim Measure activities as containing surficial and subsurface construction and demolition debris on the western end of the SWMU.

RCRA Facility Investigations (Phase I and II) were initiated in 1997 and completed in 2005. Investigations concluded that, although Constituents of Potential Concern (COPC) were identified in specific media at the site, no unacceptable risks were associated with these COPCs. In 2004, a landfill cover assessment was completed at SWMU 3. Results of the cover assessment concluded that multiple areas were present within the SWMU boundary with less than 2-feet of soil cover over former landfill areas.

In 2007, Interim Measure (IM) Construction activities were completed at SWMU 3. The IM included the placement of supplemental soil cover at locations where the landfill cover was determined to be less than 2 feet thick. Supplemental cover was obtained from on-site borrow areas as well as off-site borrow areas. Upon completion of supplemental cover placement and verification that dermal cover was 2 feet thick over all landfilled areas, the site was restored to a stable condition with a vegetative cover. Completion of the IM resulted in compliance with the physical requirements of the Selected Remedy.

## **SITE RISK**

Historical media sampling events evaluated soil, groundwater, surface water, sediment, and soil gas. Based on the results of these sampling events, Human Health and Ecological Risk Assessments were completed evaluating all Constituents of Potential Concern (COPC) that were identified in these media. The risk assessments concluded that there were no unacceptable risks associated with COPCs identified at SWMU 3 as a result of past landfill activities.

## **SCOPE OF CORRECTIVE ACTION**

Results of site-specific confirmatory sampling events and risk assessments indicate that there is no unacceptable risks associated with previously identified compounds in soil, groundwater, sediment, or surface water. Because there are no unacceptable risks, media cleanup objectives are not required to achieve media-specific regulatory standards. Media cleanup objectives at SWMU 3 will focus primarily on maintaining the integrity of the existing soil cover system to prevent human and wildlife contact with residual landfill material and subsequently ensuring that selected future land use scenarios are maintained. Media cleanup objectives will be supported by quarterly groundwater monitoring events for the initial year of monitoring in order to confirm that the current groundwater quality is maintained. Groundwater data will be evaluated following the initial year and Fort Jackson will petition for either a change in frequency or termination of the groundwater monitoring activities. Should the evaluation show monitoring results exceeding maximum contaminant levels (MCLs) or indicate that they may potentially exceed MCLs in the future, the monitoring program will be extended.

## **SWMU 6**

This FS/SOB is intended to inform the general public of the Selected Remedy, consisting of a dermal cover and land use controls (LUCs) with monitoring, for Solid Waste Management Unit 6 (SWMU 6) at Fort Jackson. The Selected Remedy was acknowledged in the July 27, 2007, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (SCDHEC personnel Stacey French to Fort Jackson personnel Lahiri Estaba). SCDHEC will make a final determination of the Selected Remedy after the public comment period has ended and all information submitted has been reviewed and considered.

The SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Subsurface Investigation Report for Relative Risk Ranking of Six SWMU Sites, Fort Jackson, South Carolina. (U.S. Army Corps of Engineers, Savannah District, October 1997)
- Phase I RCRA Facility Investigation Report for SWMUs 6, 20, 21, 23, 30, and 48, Fort Jackson, South Carolina (E&E, August 1998)
- Phase II RCRA Facility Investigation Report for SWMU 6, Revised Final Version 2, Fort Jackson, South Carolina (E&E, October 2004)
- FTJA-6/SWMU 6 Interim Measures Completion & Corrective Measures Study Report, Rev. 1 (ARCADIS, June 4, 2007)

## **PROPOSED REMEDIES**

Historical media sampling events evaluated soil (surface and subsurface), groundwater, surface water, and sediment. Evaluations of laboratory data as well as human health and ecological risk assessments of identified contaminants revealed no unacceptable risks associated with any of the constituents or media. Due to the low-risk nature of environmental impacts, as indicated by historical sampling and assessment results performed at SWMU 6, Tier I Partnering Team members concurred that this site did not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy includes maintaining the existing dermal cover, Land Use Controls (LUC), and monitoring. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

Based on evaluations of historical site-related documentation and the information gained during cover assessment activities and interim measure activities, SWMU 6 has been delineated to cover an area of approximately 15 acres. The area was actively utilized between the years of 1980 and 1989. The site is located outside of and east of the cantonment area.

Phase I and Phase II RCRA Facility Investigations were completed in 1998 and 2004 respectively. Investigations concluded that, although Constituents of Potential Concern (COPC) were identified in specific media at the site, no unacceptable risks were associated with these COPCs. In 2004, a landfill cover assessment was completed at SWMU 6. Results of the cover assessment concluded



that multiple locations were present within the SWMU boundary with less than 2-feet of soil cover over buried debris. Surficial debris was also identified sporadically over the site.

In 2006, Interim Measure (IM) Construction activities were performed at SWMU 6. The IM included the regrading of slopes, consolidation and burial of surficial debris, and installation of a 2-foot clean soil cover. The site was subsequently vegetated in order to restore the site to a stable condition. Completion of the IM resulted in compliance with the physical requirements of the Selected Remedy.

During the landfill cover assessment, several stormwater drainage deficiencies were identified. These deficiencies were addressed during the interim measure construction activities. Rip-rap lined channels, slope drains, drainage berms, and a sediment pond were installed during the interim measure construction in order to remedy these deficiencies.

## **SITE RISK**

Historical confirmatory sampling events evaluated soil, groundwater, surface water, and sediment. Based on the results of these sampling events, Human Health and Ecological Risk Assessments were completed evaluating all Constituents of Potential Concern (COPC) that were identified in these media. The risk assessments concluded that there were no unacceptable risks associated with COPCs identified at SWMU 6 as a result of the former landfill.

## **SCOPE OF CORRECTIVE ACTION**

Results of site-specific confirmatory sampling events and risk assessments indicate that there are no unacceptable risks associated with previously identified compounds in soil, groundwater, sediment, or surface water. Because there are no unacceptable risks, no media cleanup objectives are required to achieve media-specific regulatory standards. Media cleanup objectives at SWMU 6 will focus primarily on maintaining the integrity of the newly installed soil cover system to prevent human and wildlife contact with residual debris and subsequently ensuring that selected future land use scenarios are maintained. Media cleanup objectives will be supported by annual groundwater monitoring events for a limited period of time to confirm that the current groundwater quality is maintained. After an initial monitoring period, pending evaluation of the analytical results, Fort Jackson will petition for either a change in frequency or termination of the groundwater monitoring activities. Should the evaluation show monitoring results exceeding maximum contaminant levels (MCLs) or indicate that they may potentially exceed MCLs in the future, the monitoring program will be extended.

## **SWMU 14**

This FS/SOB is intended to inform the general public of the Selected Remedy, consisting of groundwater monitoring, enhanced reductive dechlorination (ERD) if necessary, and land use controls (LUCs). The Selected Remedy was acknowledged in the September 29, 2008, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (Christi Pickett to Lahiri Estaba). SCDHEC will make a final determination of the Selected Remedy after the public comment period has ended and all information submitted has been reviewed and considered.

This SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Phase I Site Investigation Report For Remedial Investigation / Feasibility Study (Law Environmental, January 1990);
- Final Report for Remedial Investigation Phase II (Law Environmental, November 1991);
- Final Addendum No. 1, Phase III RCRA Facility Investigation (RFI) Report (Earth Tech, March 21, 2003);
- SWMU 14/AOC B Interim Measure Completion Report, Revision 1 (ARCADIS, January 22, 2007);
- AOC B Soil Removal Completion and Corrective Measures Study Report. (ARCADIS, December 17, 2007);
- SWMU 14 CMS Report (ARCADIS, July 31, 2008).

## **PROPOSED REMEDIES**

Historical media sampling events evaluated surface soil, subsurface soil, groundwater, surface water, sediment, soil gas, and indoor air. Evaluations of laboratory data as well as human health risk assessments of identified constituents revealed unacceptable risks associated with groundwater at SWMU 14. Following the investigation, an enhanced reductive dechlorination (ERD) interim measure (IM) was conducted at SWMU 14 which successfully reduced groundwater concentrations. Monitoring results indicate the remaining concentrations in groundwater are naturally attenuating prior to reaching the nearest downgradient receptor, Wildcat Creek. Consequently, no additional active remedial alternatives were evaluated. Due to the low-risk nature of environmental impacts, as indicated by historical sampling and assessment results performed at SWMU 14, and the success of the IM, Tier I Partnering Team members concurred that this site did not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy was identified as groundwater monitoring, coupled with Land Use Controls (LUC) and ERD as a contingency measure if monitoring indicates that the constituents in groundwater do not continue to degrade as expected. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

SWMU 14 encompasses an area approximately 5-acres in size, located at the intersection of Lee and Washington Roads in the SW corner of Fort Jackson. SWMU 14 (Bldg 1605) was a weapons

cleaning area from 1940 to 1970 and a vehicle maintenance area from 1971 to approximately 1992. The operations in Building 1605 involved discharging spent solvents to a floor drain that flowed to a 500-gallon concrete sump. Building 1605, its associated sump, and other adjacent buildings have since been demolished for the construction of the new General Support Maintenance Facility.

RCRA Facility Investigations (Phase I, II, and III) were initiated in 1988 and completed in 2003. Investigations, as well as risk assessments, concluded that there was a potential risk associated with soil and groundwater at the site. Following the investigations, an ERD IM was conducted to reduce groundwater concentrations. An additional investigation was conducted following the IM to further investigate soil, groundwater, surface water, sediment, soil gas, and indoor air prior to selecting the final remedy.

## **SITE RISK**

Historical media sampling events evaluated soil, groundwater, surface water, sediment, soil gas, and indoor air at SWMU 14. Following the Phase III RFI, Human Health and Ecological Risk Assessments were completed evaluating all COPCs that were identified in these media. The risk assessments concluded that there were no unacceptable ecological risks associated with COPCs identified at SWMU 14 as a result of past operations. A potential risk was identified for a future adult resident for surface soil and for a future industrial worker, a future adult resident, and a future child resident for groundwater. Following the Phase III RFI, an ERD IM was conducted which successfully reduced groundwater concentrations. Groundwater concentrations continue to naturally degrade and are below groundwater clean-up goals prior to reaching the nearest downgradient receptor. Soil samples collected as part of the CMS indicated soil concentrations were below soil clean-up goal.

## **SCOPE OF CORRECTIVE ACTION**

Results of site-specific confirmatory sampling events and risk assessments indicate that there is a potential risk associated with previously identified compounds in groundwater. Media cleanup objectives were evaluated by SCDHEC and Fort Jackson to develop appropriate regulatory objectives for SWMU 14. Media cleanup objectives at SWMU 14 will focus primarily on monitoring groundwater to ensure constituent concentrations continue to naturally degrade prior to reaching the nearest downgradient receptor, Wildcat Creek. Media cleanup objectives will be supported by semi-annual groundwater monitoring events and annual surface water sampling events in order to confirm that the current groundwater quality is maintained. Groundwater data will be evaluated following two years of monitoring and Fort Jackson may petition for a change in frequency of the groundwater monitoring activities.

## **SWMU 21**

This FS/SOB is intended to inform the general public of the Selected Remedy, consisting of a dermal cover and land use controls (LUCs) with monitoring, for Solid Waste Management Unit 21 (SWMU 21) at Fort Jackson. The Selected Remedy was acknowledged in the July 23, 2007, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (SCDHEC personnel Stacey French to Fort Jackson personnel Lahiri Estaba). SCDHEC will make a final determination of the Selected Remedy after the public comment period has ended and all information submitted has been reviewed and considered.

The SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Subsurface Investigation Report for Relative Risk Ranking of Six SWMU Sites, Fort Jackson, South Carolina. (U.S. Army Corps of Engineers, Savannah District, October 1997)
- Phase I RCRA Facility Investigation Report for SWMUs 6, 20, 21, 23, 30, and 48, Fort Jackson, South Carolina (E&E, August 1998)
- Phase II RCRA Facility Investigations Report for SWMU 21, Fort Jackson, South Carolina, Revised Final Version 2, (E&E, May 2004)
- SWMU 21 Consolidation/Investigation Completion Report, Revision 2. (ARCADIS, September 18, 2006)
- FTJA-21/SWMU 21 Inactive Range 17 Landfill Interim Measures Completion & Corrective Measures Study Report, Rev. 1 (ARCADIS, June 4, 2007)

## **PROPOSED REMEDIES**

Historical media sampling events evaluated soil (surface and subsurface), groundwater, surface water, and sediment. Evaluations of laboratory data as well as human health and ecological risk assessments of identified contaminants revealed no unacceptable risks associated with any of the constituents or media. Due to the low-risk nature of environmental impacts, as indicated by historical sampling and assessment results performed at SWMU 21, Tier I Partnering Team members concurred that this site did not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy includes maintaining the existing dermal cover, Land Use Controls (LUC), and monitoring. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

Based on evaluations of historical site-related documentation, information gained during cover assessment activities, and the completion of interim measures activities, SWMU 21 has been delineated to cover an area of approximately 5.4 acres. The area was actively utilized between the years of 1986 and 1989 for the disposal of construction and demolition material. The site is located outside of and east of the cantonment area.

Phase I and Phase II RCRA Facility Investigations were completed in 1998 and 2004 respectively. Investigations concluded that, although Constituents of Potential Concern (COPC) were identified in specific media at the site, no unacceptable risks were associated with these COPCs. In 2004, a landfill cover assessment was completed at SWMU 21. The cover assessment identified 22 surficial debris piles located within the SWMU boundary.

In 2005, a Consolidation/Investigation was initiated in order to remove previously identified surficial debris piles. Approximately 2,000 cubic yards of concrete and 50 tons of metal were consolidated and recycled as part of this investigation. Activities were discontinued due to the discovery of significant quantities of buried debris. At the conclusion of consolidation activities, the footprint of the SWMU (area containing buried debris) had been reduced to approximately 5.4 acres.

In 2006, Interim Measure (IM) Construction activities were completed at SWMU 21 in order to address the remaining buried debris. The IM included general grading of the SWMU footprint and the placement of 2-feet of clean soil cover over the identified debris. Drainage improvements including rip-rap lined ditches were also made to the site. The site was subsequently vegetated in order to restore the site to a stable condition. Completion of the IM resulted in compliance with the physical requirements of the Selected Remedy.

## **SITE RISK**

Historical confirmatory sampling events evaluated soil, groundwater, surface water, and sediment. Based on the results of these sampling events, Human Health and Ecological Risk Assessments were completed evaluating all Constituents of Potential Concern (COPC) that were identified in these media. The risk assessments concluded that there were no unacceptable risks associated with COPCs identified at SWMU 21 as a result of the former landfill.

## **SCOPE OF CORRECTIVE ACTION**

Results of site-specific confirmatory sampling events and risk assessments indicate that there are no unacceptable risks associated with previously identified compounds in soil, groundwater, sediment, or surface water. Because there are no unacceptable risks, no media cleanup objectives are required to achieve media-specific regulatory standards. Media cleanup objectives at SWMU 21 will focus primarily on maintaining the integrity of the newly installed soil cover system to prevent human and wildlife contact with residual debris and subsequently ensuring that selected future land use scenarios are maintained. Media cleanup objectives will be supported by annual groundwater monitoring events for a limited period of time to confirm that the current groundwater quality is maintained. After an initial monitoring period, pending evaluation of the analytical results, Fort Jackson will petition for either a change in frequency or termination of the groundwater monitoring activities. Should the evaluation show monitoring results exceeding maximum contaminant levels (MCLs) or indicate that they may potentially exceed MCLs in the future, the monitoring program will be extended.

## **SWMU 39**

This FS/SOB is intended to inform the general public of the no further action (NFA) decision for Solid Waste Management Unit (SWMU) 39 at Fort Jackson, as acknowledged in the June 14, 2006, South Carolina Department of Health and Environmental Control (DHEC) letter (Amick to Estaba). DHEC will make a final determination on the closure of this site after the public comment period has ended and all information submitted has been reviewed and considered.

The SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Confirmatory Sampling (CS) Work Plan for SWMUs 5, 11, 18, 19, 24, 27, 29, 31, 32, 33, 34, 38, 39, 40 and Area of Concern C (AOC C), Savannah Corps of Engineers - HTRW Section (CESAS), 1995 - revised
- CS Report for SWMUs 5, 11, 18, 19, 24, 27, 29, 31, 32, 33, 34, 38, 39, 40 and AOC C, Final, Ecology and Environment, Inc.(E&E), 1997
- ENSR Corporation, Revised Supplemental Confirmatory Sampling Report - SWMU 39 and 40, Leesburg Training Center, August 2000
- ENSR Corporation, Interim Measure Report - SWMU 39 and 40, Leesburg Training Center, August 2002
- ENSR Corporation, Revised RCRA Facility Investigation (RFI) Report - SWMU 39, Leesburg Training Center, January 2006

## **PROPOSED REMEDIES**

Based on the findings of investigations performed for SWMU 39, a remedy was not required. NFA was recommended and approved by SCDHEC.

## **SITE BACKGROUND**

SWMU 39 is located in the north side of the Fort Jackson cantonment area, adjacent to former Building 9428, off of Hampton Parkway across from Field Street. The former wash pad and oil/water separator consisted of a 50-foot by 30-foot concrete wash pad and a 200-gallon capacity oil/water separator, which operated from the 1960s to the early 1990s. The drain that led to the separator was located on the edge of the wash pad near the separator. A crescent-shaped grass-covered area was located on each of the 50-foot sides of the wash pad. A storm drain was located at the edge of the grass covered area on the southwest side of the site. Prior to 1974, effluent from the separator was discharged to the Storm Water System (SWMU 31) and after 1974, the separator discharged to the Sanitary Sewer System (SWMU 32). The oil was removed from the separator every six months and the separator was cleaned every year. The waste oil was transported off site by an oil recovery firm. All the buildings surrounding this SWMU, including Building 9428 were demolished and removed in the early 90s. The site was evaluated as part of the Fort Jackson RFA performed in 1990.

## **SITE RISK**

CS and RFI were required by the RCRA Part B Permit based on recommendations from the 1990 RCRA Facility Assessment. After review of the 1997 CS Report, DHEC required supplemental CS work to satisfy RCRA guidelines. After the Supplemental CS was completed in 1999, DHEC requested a RCRA Facility Investigation (RFI). The RFI was completed when DHEC concurred that the previous Fort Jackson documents and the RFI were technically adequate and sufficed to determine that no overt site environmental risks were evident at SWMU 39. DHEC corroborated this in a letter dated June 14, 2006, where conditional approval of the RFI and its recommendations for no further action (NFA) were approved. The conditions (background values should be used correctly and DHEC needs information on supply wells) is that the RFI and NFA approval is based on the information presented by Fort Jackson and its contractors.

## **SCOPE OF CORRECTIVE ACTION**

The RCRA Part B Permit required a CS. Regardless of limited significant findings, the regulatory review of the 1995 CS Report, required supplemental CS work to satisfy the RCRA guidelines. The Supplemental CS included the collection of additional soil samples. The samples were tested for Volatile Organic Compounds (VOCs), Semi Volatile Organic Compounds (SVOCs), and Total Petroleum Hydrocarbons-Diesel Range (TPH-D). Analytical results of the second round of CS revealed acetone as the only VOC in soils at 0.057ug/kg and no SVOCs detected. Total petroleum hydrocarbon results were up to 32mg/kg. The one groundwater sample was also tested for VOCs, SVOCs and TPH-D. None of the parameters were detected above laboratory instrument detection limits in this sample. Fort Jackson requested a NFA decision. DHEC responded that an RFI was required. An RFI was completed that included the collection of (8) sets of surface and subsurface soil samples and the collection of (2) groundwater samples with associated QA/QC samples. Analytical parameters were recommended by SCDHEC after reviewing the previous investigations (SVOCs: 4-nitrophenol, pyrene, butyl benzyl phthalate, bis(2-ethylhexyl) phthalate, bis(2-ethylhexyl)phthalate and the metals: arsenic, barium, cadmium, chromium, copper, lead, nickel, thallium, tin, vanadium and zinc). Results of the RFI and the previous investigations indicated the presence of a limited number of SVOCs in soil samples at concentrations that were lower during the RFI (i.e., pyrene and bis(2-ethylhexyl) phthalate were below EPA Region IX PRGs for residential sites). Based on the RFI, SVOCs are not present at levels requiring remedial action. Metals were detected above background concentrations (10 of the 11 metals suite) in at least 2 of the RFI soil samples, but only (2) metals, arsenic and vanadium were detected above EPA Region IX PRGs. Vanadium was just above its Residential PRG in two samples. Arsenic was detected above its residential PRG in all soil samples. It is important to note that the facility soil background levels also exceed the industrial PRG for arsenic.

Although several remaining metals exceed their respective background concentrations at various locations around SWMU 39, these concentrations do not appear to warrant any remedial action for the soils at SWMU 39, because they do not exceed their respective residential PRGs.

Several metals were detected in the groundwater sample collected during the April 2003 RFI sampling event from MW39-1. Only lead at 21.3 ug/L was above its MCL (15 ug/L). Only (3) metals were detected in the groundwater sample collected in August 2004. The results from 2003 therefore appeared to be higher due to a higher observed sample turbidity (i.e., Lead slightly

>MCL in 2003). In 2004 more time was spent to collect a higher quality, less turbid sample. None of the reported metals concentrations exceeded their respective MCLs or SMCLs in the August 2004 groundwater sample.

DHEC reviewed all of the data collected over the years and performed stringent reviews and several rounds of comment generation on the CS Reports and then the RFI Report. Fort Jackson responded to the comments as prepared by the SCARNG, until DHEC concurred in 2006 with the technical adequacy of the last round of report revisions and comment responses. DHEC issued a NFA decision in a letter dated June 14, 2006 (Amick to Estaba).



## **SWMU 47**

This FS/SOB is intended to inform the general public of the No Further Action (NFA) recommendation for SWMU 47. The NFA recommendation was approved in the April 3, 2008, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (Christi Pickett to Lahiri Estaba).

This SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Revised Phase II RCRA Facility Investigation and Interim Measure Completion Report, Revision 1.0 (ARCADIS, February 5, 2008);
- Final Phase II RCRA Facility Investigation for SWMU 47 Former Roads and Grounds Storage Area (USACE, November 2003);
- RCRA Facility Investigation Report for Solid Waste Management Unit 47 (Ecology and Environment, Inc., 1998);
- Final Field Report SWMU 47 (Omega Environmental Services, 2001).

## **PROPOSED REMEDIES**

Historical media sampling events evaluated soil and groundwater. Evaluations of laboratory data revealed no unacceptable risks associated with any constituents or media at SWMU 47. Due to the low-risk nature of environmental impacts, as indicated by historical sampling, Tier I Partnering Team members concurred that NFA was required at SWMU 47. NFA was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

SWMU 47, the former roads and grounds storage area at Fort Jackson. SWMU 47 was originally identified as an area approximately 40 feet by 25 feet where roads and grounds maintenance was performed. SWMU 47 is a grass covered area located in the southern portion of Fort Jackson. The site was used for at least 16 years, beginning before 1972 and ending in spring 1988. Diesel fuel and fuel oil were managed wastes stored at SWMU 47. The site was also used to store and clean an asphalt spreader and to store abandoned fuel oil tanks. The asphalt spreader was reportedly cleaned with diesel fuel, which was poured over the spreader and allowed to drain onto the ground.

RCRA Facility Investigations (Phase I and II) were initiated in 1998 and completed in 2008. Investigations concluded that there was a potential risk associated with soil and groundwater at the site. During the investigations, an interim measure (IM) was conducted to remove impacted soil and groundwater.

An IM was conducted in 1999 to remove TPH contaminated soils. Following the excavation, Light Non-Aqueous Phase Liquid (LNAPL) was discovered, as well as elevated levels of mercury, chloromethane, and naphthalene. Additional monitoring conducted in 2004 indicated all metals, including mercury, were well below the MCL and SCDHEC Water Quality Standard. A recovery well was installed by the Corps of Engineers, Savannah District. The Corps assumed the project

and periodically bailed product from the recovery well until the award of the performance based contract in late 2003.

Monthly LNAPL recovery activities were conducted between October 2004 and November 2006. Approximately 400 ounces of LNAPL were removed from the recovery well during the latter recovery events. In addition to LNAPL recovery, a monitoring program was established to confirm the presence and the degradation of constituents of concern previously detected in groundwater. The sample results indicate there are no constituents of concern remaining in groundwater. In December 2006, an additional IM was conducted to address the residual LNAPL in the recovery well by excavating the soil surrounding the recovery well and removing residual LNAPL from the groundwater and associated soil. The excavation was left open for 2 months to ensure no residual LNAPL remained. Confirmation samples collected from the walls of the excavation near the water table and the groundwater seeping into the excavation confirmed that the IM was successful in removing the residual LNAPL and associated soil.

This no further action alternative was selected by Fort Jackson, with support from South Carolina Department of Health and Environmental Control (SCDHEC).

## **SITE RISK**

Investigation at the Site began in 1997. At that time, elevated TPH concentrations were found in soil and sediment samples. Groundwater also showed elevated concentrations of TPH as well as exceedances of Federal MCLs for arsenic, chromium, lead, mercury, and phenanthrene. Additional investigations were conducted which indicated groundwater exceedances of Federal MCLs for Mercury and exceedances of the EPA Region 9 Preliminary Remedial Goals (PRGs) for chloromethane and naphthalene.

The initial IM in 1999 was conducted to remove TPH contaminated soils. A monthly LNAPL removal and groundwater monitoring program was initiated in October 2004. Groundwater monitoring data now indicate that all parameters are below Federal MCLs. An additional IM was conducted in December 2006 which successfully removed the remaining LNAPL.

## **SCOPE OF CORRECTIVE ACTION**

The IMs conducted at SWMU 47 successfully removed all of the impacted soil and LNAPL. Groundwater monitoring confirmed that the groundwater is below the EPA Maximum Contaminant Levels (MCLs) or the SCDHEC Region 9 Tap Water Preliminary Remediation Levels (PRGs). Consequently, no additional corrective actions were considered for SWMU 47.

## **SWMU 48**

This FS/SOB is intended to inform the general public of the Selected Remedy, consisting of soil excavation (completed as part of Interim Measures), maintenance of the existing surficial cover (concrete, asphalt, and soil), and land use controls (LUCs) along with groundwater monitoring, for SWMU 48 at Fort Jackson. The Selected Remedy was acknowledged in the September 25, 2008, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (Christi Pickett to Lahiri Estaba). SCDHEC will make a final determination of the Selected Remedy after the public comment period has ended and all information submitted has been reviewed and considered.

This FS/SOB should not be considered the primary source of information for this site. The FS/SOB summarizes information that can be found in greater detail in the following documents:

- Phase I RCRA Facility Investigation Report for Solid Waste Management Unit 48, (E&E 1998);
- Phase II RCRA Facility Investigation Report for Solid Waste Management Unit 48, (E&E, 2006)
- SWMU 48 Completion of Floor Drain Abandonment Letter Report (ARCADIS, 2007)
- SWMU 48 Corrective Measures Study Work Plan, (ARCADIS, 2007)
- SWMU 48 Corrective Measures Study Report (ARCADIS, 2008)

## **PROPOSED REMEDIES**

Historical media sampling events evaluated surface soil, subsurface soil, and groundwater both inside and outside the SWMU boundary. Evaluations of laboratory data as well as human health and ecological risk assessments of identified contaminants revealed no unacceptable risks associated with any of the constituents or media at SWMU 48. Due to the low-risk nature of environmental impacts, as indicated by historical sampling and assessment results performed at SWMU 48, Tier I Partnering Team members concurred that this site did not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy was identified as soil excavation, maintenance of the existing surficial cover coupled with Land Use Controls (LUC) and groundwater monitoring. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

Solid Waste Management Unit 48 (SWMU 48), also known as the Inactive Building 6586 Acid Pit, encompasses a former 3 foot x 3 foot x 5 foot deep former neutralized battery acid disposal pit, adjacent oil/water separator, associated piping, and concrete foundation slab from the former Building 6586. SWMU 48 was actively utilized between the years of 1952 and 1992. Building 6586 was demolished in 1999 with the concrete foundation slab being left in place. Other components of SWMU 48 (disposal pit, oil/water separator, underground piping) were also removed as part of Interim Remedial Measures conducted in 1999 and 2002 at Fort Jackson. The site is currently inactive and is located just off of Lee Road in the central portion of the cantonment area. At the

present time, a portion of the site is utilized as an access driveway to the Fort Jackson Recycling Center.

RCRA Facility Investigations (Phase I and II) were initiated in 1998 and completed in 2006. Investigations, as well as risk assessments, concluded that although Constituents of Potential Concern (COPC) were identified in specific media at the site, no unacceptable risks were associated with these COPCs.

In 2007, Floor Drain abandonment activities were completed in order to eliminate any potential conduit from the surface of the former concrete foundation slab to the subsurface. Eight floor drains were abandoned with concrete slurry placed a minimum of 5 feet into the drain. In addition, a previously abandoned basin had additional concrete placed in order to bring it flush with the surrounding areas. Also in 2007, drainage improvements were completed at SWMU 48 in an effort to minimize potential erosion of non-paved areas at the site.

## **SITE RISK**

Historical media sampling events evaluated soil and groundwater at SWMU 48. Based on the results of these sampling events, Human Health and Ecological Risk Assessments were completed evaluating all COPCs that were identified in these media. The risk assessments concluded that there were no unacceptable risks associated with COPCs identified at SWMU 48 as a result of past operations.

## **SCOPE OF CORRECTIVE ACTION**

Results of site-specific confirmatory sampling events and risk assessments indicate that there are no unacceptable risks associated with previously identified compounds in soil and groundwater. Because there are no unacceptable risks, media cleanup objectives were evaluated by SCDHEC and Fort Jackson to develop appropriate regulatory objectives for SWMU 48. Media cleanup objectives at SWMU 48 will focus primarily on maintaining the integrity of the existing cover system (soil, concrete, asphalt) to provide isolation of SWMU 48 from human and wildlife and subsequently ensuring that selected future land use scenarios are maintained. Media cleanup objectives will be supported by quarterly groundwater monitoring events for an initial period of one year in order to confirm that the current groundwater quality is maintained. Groundwater data will be evaluated following the initial year and Fort Jackson may petition for either a change in frequency or termination of the groundwater monitoring activities. Should the evaluation show monitoring results exceeding maximum contaminant levels (MCLs) or indicate that they may potentially exceed MCLs in the future, the monitoring program will be extended.

## **SWMU 50**

This FS/SOB is intended to inform the general public of the Selected Remedy, consisting of a dermal cover and land use controls (LUCs) with monitoring, for Solid Waste Management Unit 50 (SWMU 50) at Fort Jackson as acknowledged in the January 2009, South Carolina Department of Health and Environmental Control (DHEC) memorandum (DHEC personnel Christi Pickett to Lahiri Estaba, Fort Jackson). DHEC will make a final determination on the closure of this site after the public comment period has ended and all information submitted has been reviewed and considered.

The SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- SWMU Assessment Report, SCARNG Environmental Office, July 1999
- RCRA Facility Investigation (RFI) Work Plan (WP), Kleen Sites Geoservices (KSG), October 2000
- Phase I RFI Report, KSG, September 2003
- Corrective Measures Study (CMS) WP, KSG, April 2006
- Corrective Measures Study Report, KSG, January 2009

## **PROPOSED REMEDIES**

Due to the low-risk nature of environmental impacts as indicated by historical sampling and assessment results performed at SWMU 50, Tier I Partnering Team members concurred that this site does not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, the Selected Remedy includes maintaining the existing dermal cover, LUCs, and monitoring. The Selected Remedy was recommended by Fort Jackson agreed upon by SCDHEC.

## **SITE BACKGROUND**

SWMU 50 was discovered in 1999 by the SCARNG, during an investigation for a new building site. The SWMU is located in the SC Army National Guard (SCARNG) licensed area, in the southeastern region of Fort Jackson. It lies north of a paved road extending from Golden Lion Road, heading toward Highway 601. No written documentation of this site was found by SCARNG or Fort Jackson. Historical information was gathered from discussions with present and former employees.

SWMU 50 is an unlined construction and debris landfill. The site appears to cover a rectangular area comprising approximately 0.8 acres and is covered by mature vegetation consisting primarily of grass, shrubs, and pine trees approximately 15 years of age and younger. The perceived boundary of the former landfill is delineated by the distinct age difference between the 0.8 acres of young trees and the surrounding pine forest consisting of 30-40 year old trees. The operational history is believed to have been between a 1973 and 1985. The site reportedly received construction debris and inert materials that were buried in trenches oriented parallel with the paved

road. A five-acre man-made lake, known as Varn Lake, is located approximately 450 feet towards the south of SWMU 50. The lake and its surrounding areas are used for recreational purposes.

## **SITE RISK**

RFI sampling events evaluated soil and groundwater quality for VOCs, SVOCs, PCBS and pesticides and RCRA metals. RFI results indicate that there are no exceedances of regulatory screening criteria in soils tested. Five soil samples exceeded background levels, three for barium and two for lead. But, all were all below generic SSL and Region IV Ecological screening levels.

Arsenic, chromium and lead were found to slightly exceed DHEC drinking water standards, but it should be noted that these samples were unfiltered. Suspended silt and clay particles remained in the ground water samples, in spite of efforts to remove them by carefully developing the wells. In addition, these metals are naturally occurring and prevalent in this area. Filtered samples for the same wells showed minimal detections that were all below drinking water criteria. Furthermore, field measurements did not detect the presence of methane within any of the vapor monitor well network. This is approximately 20 years after land filling was discontinued. Therefore, review of the data revealed little if any impact attributed to the buried waste at this landfill.

Based on the evaluation RFI findings, it appears that geologic conditions provide some degree of containment for the buried waste, as the waste appears to be buried in the clay rich zones. In addition, cover assessment activities confirmed SWMU 50 to have a minimum of two feet of soil cover existing across the entire landfill area. Field observations and visual inspections revealed that no stormwater drainage deficiencies and no significant surficial debris were present.

## **SCOPE OF CORRECTIVE ACTION**

A CMI WP will be prepared in 2009 to document the final remedies proposed in the CMS, to include dermal site cover maintenance, groundwater monitoring, and LUCs.

The RFI found no exceedances of regulatory criteria in soils. Only minor exceedances were found in groundwater and they are likely unrelated to the buried waste. Because of little, if any environmental impact attributable to the landfill, there are no media cleanup objectives required to achieve media-specific regulatory standards. Media cleanup objectives at SWMU 50 will focus primarily on maintaining the integrity of the existing final cover system to prevent future contact with buried debris and subsequently ensuring that selected future land use scenarios are maintained. Media cleanup objectives will include regular groundwater monitoring events for a limited period of time to confirm that the current groundwater quality is maintained. Five-year reviews will also be conducted and reports prepared to document that the selected remedy remains protective of human health and the environment.

## **SWMU 52**

This FB/SOB is intended to inform the general public of the no further action decision for Solid Waste Management Unit 52 at FTJA, as acknowledged in the October 31, 2006, South Carolina Department of Health and Environmental Control (DHEC) letter (Amick to Estaba). DHEC will make a final determination on the closure of this site after the public comment period has ended and all information submitted has been reviewed and considered.

The SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- ARCADIS, 2004. SWMU Assessment Report for FTJA-40.
- ARCADIS, 2005. Confirmation Sampling Report for SWMU 52.

## **PROPOSED REMEDIES**

Results of the human health risk assessment indicate that none of the COPCs identified pose a significant risk to human health or the environment. Due to the low-risk nature of environmental impacts as indicated by historical sampling and assessment results performed at SWMU 52, Tier I Partnering Team members concurred that this site does not require an extensive evaluation of remedial alternatives. Based on the low-risk nature of environmental impacts and subsequent minimal exposure concerns, no further remedial action is warranted. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

A parcel known as Boyden Arbor Site B was acquired by the United States government in 1940 when Fort Jackson expanded from its prewar boundaries. The parcel is approximately 11.9 acres in size and prior to Army acquisition, was mostly wooded. In the early 1940s, light gun shops, a TRS, a wash rack, and a vehicle parking area were constructed on high ground in the southernmost portion of Site B. The former TRS was located on a relatively small parcel of Site B approximately 35 feet east of the current Interstate Highway 77 (I-77). The TRS has been designated as SWMU 52 by the SC Department of Health and Environmental Control. I-77 separates this parcel from the Cantonment area of Fort Jackson. West of the former TRS is Fort Jackson Boulevard, which connects with Percival Road downgradient of the TRS. This section of Fort Jackson Boulevard has been abandoned and blocked off from Percival Road by a soil barricade.

The TRS consisted of Building 13-181, which was built in 1941, and wash rack 13-182. There are no written records that document the use of building 13-181 as a tank repair shop. However, aerial photographs dated from 1960 to 1966 depict images that resemble the top outlines of a tank or armored personnel carrier. The 10<sup>th</sup> Transportation Company occupied the cluster of buildings at the end of Fort Jackson Boulevard that included Building 13-181 from approximately 1974 to 1990. The 10<sup>th</sup> Transportation Company served as a military unit that hauled supplies and equipment to troops in 6 X 6 and tractor-trailer trucks. During this time, Building 13-181 was used as a truck maintenance shop.

Following the departure of the 10<sup>th</sup> Transportation Company in 1990, the building was occupied by the 48<sup>th</sup> Explosive Ordnance Demolition (EOD) for approximately two years. Explosive ordnance was not stored on the premises at any time during the use of the buildings by the EOD.

A smokestack and 1,000-gallon oil heating underground storage tank (UST) were located on the northwest side of building 13-181. An unidentified South Carolina Department of Transportation (SCDOT) contractor demolished Building 13-181 in 1992 during construction of I-77. Significant excavation and grading was conducted to construct I-77 and only one-third of the footprint of Building 13-181 is inside the current interstate fence. The heating oil UST was also removed under the SCDOT contract. There is no record of contamination related to this tank and its exact location is unknown. A concrete pad approximately 40 feet by 88 feet is all that remains after demolition of the wash rack. The locations of I-77, former Building 13-181, wash rack 13-182, the former smokestack, and the former 1,000-gallon oil heating UST are shown on Attachment 2. The completed elevation of I-77 is approximately 30 feet below the former Building 13-181 elevation.

## **SITE RISK**

A human health risk assessment was conducted for the SWMU. The sum of the ELCR estimates for the adult and child residents (Table 5-13) was  $3 \times 10^{-5}$  (within the benchmark range of  $10^{-6}$  to  $10^{-4}$ ), and the sum of the HI estimates for the residents was 0.001 (below the benchmark of 1). The calculated total site risk for each receptor was below or within the benchmark range of  $10^{-6}$  to  $10^{-4}$  for cancer risk, and the calculated total hazard for each receptor was below the benchmark range of 1 for non-cancer hazard. Based on the results of the human health risk assessment, the constituent concentrations in the surficial soil in the former TRS area (FTJA-40/SWMU 52) of the Fort Jackson site are unlikely to present a significant risk to human health under commercial/industrial or residential exposure conditions. The detected groundwater concentrations were below either the USEPA Region 9 PRG or the MCL. NFA was recommended and SCDHEC concurred.

## **SCOPE OF CORRECTIVE ACTION**

The data collected in the soils and groundwater, were evaluated to determine the nature and extent of any potential impacts from historical activities at SWMU 52. The analytical data collected during the SWMU Assessment and Confirmation Sampling investigations, were evaluated against the EPA and DHEC criteria, as well as background data gathered from the 2001 FTJA Soil Background Study, to identify any potential risks to human health from exposure to any detected constituents. In each case, it was determined that there was no complete migration pathway or notable risk under current site use. Therefore, the NFA recommendation by FTJA for this site was approved by DHEC.



## **AOC B**

This FS/SOB is intended to inform the general public of the No Further Action recommendation with regards to on site soils and groundwater. The recommendation was acknowledged in the August 11, 2008, South Carolina Department of Health and Environmental Control (SCDHEC) approval letter (Christi Pickett to Lahiri Estaba). SCDHEC will make a final determination of No Further Action after the public comment period has ended and all information submitted has been reviewed and considered.

This SOB should not be considered the primary source of information for this site. The SOB summarizes information that can be found in greater detail in the following documents:

- Final Addendum No 1, Phase II RCRA Facility Investigation (RFI) Report. Former Weapons Cleaning Area (SWMU 14) and Aboveground Fuel Tank Area (AOC B). Fort Jackson, South Carolina. (Earth Tech, 2003);
- SWMU 14/AOC B Interim Measure Completion Report, US Army Training Center and Fort Jackson, Fort Jackson, South Carolina. (ARCADIS, 2006)
- AOC B Soil Removal Completion & Corrective Measure Study Report, Revision 1 (ARCADIS, 2008)

## **PROPOSED REMEDIES**

The soil removal activities conducted at AOC B successfully removed all of the petroleum impacted source area soils. Post excavation soil sampling confirmed that the soils above the Residential PRGs have been removed. Consequently, no additional remedial alternatives for soils were considered for AOC B. Groundwater remedial alternatives were not addressed due to the fact that the commingled plume will be addressed as part of the SWMU 14 remedial activities. The Selected Remedy was recommended by Fort Jackson and agreed upon by SCDHEC.

## **SITE BACKGROUND**

Area of Concern B (AOC B) encompasses the area formerly containing 2 ó 200,000 gallon diesel fuel aboveground storage tanks (ASTs # 1619 and #1700) and their associated pumping facilities. The site is located within the cantonment area, on Washington Road approximately 300 feet south of Building 1605. Both ASTs, associated pumps, select piping, and containment structures were removed in 2002. Currently, the site is maintained within a secure chain-link fence.

Early investigations at the site, detailed in the Phase I and Phase II Remedial Investigation, identified chlorinated VOCs and petroleum hydrocarbons in soil and groundwater. Subsequent investigations were conducted and have been detailed in the Phase III RFI / Baseline Risk Assessment (EarthTech, 2003).

Surface and subsurface soil samples have been collected in the vicinity of the former ASTs throughout the historical investigations. A number of VOCs and SVOCs associated with petroleum hydrocarbons were detected in surface and subsurface soils during these investigations. Concentrations of VOCs and SVOCs in exceedance of Residential Preliminary

Remediation Goals (PRGs) or Risk Based Screening Levels (RBSLs) were detected at multiple locations at the site.

Historical groundwater investigations at the site have revealed the presence of LNAPL in one monitoring well at the site. Historical LNAPL recovery efforts in this well have resulted in low recovery volumes. In addition to LNAPL, a number of petroleum hydrocarbon constituents as well as chlorinated compounds have been detected historically in monitoring wells in the vicinity of AOC B. Chlorinated compounds have been determined to be originating from SWMU 14 (Former Weapons Cleaning Area), located across Washington Road from AOC B.

In 2002, the ASTs, associated piping and pumping facilities, and contaminated soils were removed from the site. In 2004, additional site investigations were completed including the completion of Cone Penetrometer Test / Ultraviolet Induced Florescence (CPT/UVIF) testing, installation of temporary monitoring wells, and LNAPL bail down tests.

In 2006, a soil removal activity was completed at AOC B. The soil removal activity included the removal and disposal of approximately 2,100 tons of source area soils. In addition, approximately 150,000 gallons of stormwater and groundwater that had filled the excavation was removed and disposed of off-site. Confirmation soil sampling activities verified that no exceedances of the Residential Preliminary Remediation Goals (PRGs) were present in the samples collected. The excavation was subsequently backfilled with material from the on-site Fort Jackson borrow area.

## **SITE RISK**

Investigation at AOC B began in 1989. At that time, elevated concentrations of petroleum compounds were found in soil samples. Groundwater showed elevated concentrations of petroleum compounds as well as chlorinated compounds originating from the former weapons cleaning area (SWMU 14). Additional investigations were conducted to further delineate these compounds in soil and groundwater.

Soil excavation activities completed in 2007 were conducted to remove petroleum related compounds in soils. Post excavation soil sampling indicated that petroleum compounds in source area soils in exceedance of the Residential PRGs have been removed. Groundwater monitoring data indicate that petroleum compounds from AOC B are comingled with the chlorinated solvent plume with SWMU 14. The comingled plume will be addressed as part of the SWMU 14 remedial activities.

## **SCOPE OF CORRECTIVE ACTION**

Upon completion of soil removal activities at AOC B, no further action is required with regards to previously identified petroleum impacted source area soils. Post excavation soil sampling confirmed that the soils above the Residential PRGs have been removed. Consequently, no additional corrective actions for soils were considered for AOC B. Groundwater corrective actions were not addressed due to the fact that the comingled plume will be addressed as part of the SWMU 14 remedial activities.

## Public Participation

The final remedy selection will be based on community acceptance. Your participation and comments are key to a complete evaluation.

You can review any or all of the documents about these SWMUs. They are available as part of the Administrative Record, which is located in the following locations:

The South Carolina Department of Health  
and Environmental Control  
Bureau of Land and Waste Management  
Stern Business Building  
8911 Farrow Road  
Columbia, South Carolina 29203  
Phone: (803) 896-4000

HQ, U.S. Army Garrison, Fort Jackson  
DLE, Environmental and Natural  
Resources Division  
2563 Essayons Way, IMSE-JAC-LGE  
(Lahiri Estaba)  
Fort Jackson, S.C. 29207-5670  
Phone: (803) 751-7332

Those persons wishing to comment on the items discussed above, should submit their comments in writing to:

S.C. Department of Health & Environmental Control  
ATTN: Richard Haynes, P.E., Director  
Waste Management Division  
Bureau of Land & Waste Management  
2600 Bull St.  
Columbia, South Carolina 29201

To be considered, all requests and/or comments must be received in writing no later than March 18, 2009, at which time the sixty (45) day public comment period will end.

A public meeting for the draft permit modification is scheduled for February 24, 2009, at 6:30 p.m. The meeting will be held at the:

Brennen Elementary School  
4438 Devereaux Road  
Columbia, South Carolina, 29205-2136

Any interest persons may participate in the public meeting by giving oral or written statements. Any individuals with disabilities or special needs who wish to participate in these proceeding or review these filings should contact Christi Pickett at (803) 896-4131 at least one week in advance to discuss any special aids or services required.

Requests to be placed on a mailing list for notification of future public notices or public meetings by the Division of Waste Management should be made in writing to the attention of Ms. Norma West at the above-given Bureau of Land and Waste Management address, or by e-mail at: [WestNJ@dhec.sc.gov](mailto:WestNJ@dhec.sc.gov) .